killing
262 fish was apparently regarded more lightly by many Buddhists
226 than killing of larger animals, but fishing on (1)wan (4)phra,
784 the weekly holy day, was forbidden. Fish were caught from the
canal with nets, traps, spears and hooks. Some were trapped
226 in trenches in the rice fields. Techniques varied with the
varieties of fish mature and plentiful at different seasons.[1]
228 Moreover, every house had a fish pond. It was usually the
hole from which earth had been removed for mounding the home
site, and was connected by a ditch to the canal. Fish were
lured from the canal into the pond by clearing it of injurious
undergrowth, planting appropriate fish-feeding plants, of

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251 Smaller fish were preserved as fermented fish. The fish
with bones left in, were salted overnight. This product was
263 called (1)plaa (1)raa. For fermented fish to be used as
seasoning, in various dishes, the liquid was drained off, then
the fish were washed and mixed with salt and specially pre-
pared rice. This had been soaked overnight, fried and pounded.
The mixture was allowed to ferment in a small jar for from 2
weeks to 2 or 3 months, depending on the product desired.
Large bones were removed by putting the product through a col-
ander before use. Fermented fish had the advantage that it
could be eaten without further preparation, and the flavor was
generally liked.

Small shrimp, which were caught in quantity during only
about 3 weeks in February, were made into shrimp paste as
follows: the shrimp were washed, mixed with salt and allowed
to stand overnight. The liquid was drained off, and the shrimp
were spread out on trays and exposed to the sun for a day or
so. Larger ones might then be beaten to loosen the shells,
which could be winnowed away. For very small shrimp, this
step was omitted. The shrimp were then pounded thoroughly in
a mortar, and stored in a jar for about a month before use.
Very small fish were sometimes made into fish paste in the
same way. The yield was about 2 kg. of the tannish or grayish
colored shrimp paste from 4 baskets (4/5 tang) of shrimp.
Shrimp paste or (2)ka-(2)pi was an essential ingredient of
Thai hot dishes.

The liquid which was drained off from the mixture of
fish or shrimp and salt in the first stage of preparing fer-
mented fish or shrimp paste was used by some villagers to pre-
pare (4)nam (1)plaa or fishsoy. The liquid was boiled with
certain green leaves such as mango leaves, onion, garlic and
salt for from 30 minutes to an hour, then it was strained.
263 The resulting red-brown liquid was bottled and was ready for
use as a condiment.

136 1. Sharp et al. (1953, pp. 185-196) described some
common fishing techniques and listed 32 varieties of fish
known to be found in Bang Chan in 1948-49.

228 which the leafy vegetable (2)phag (2)ka-(2)cheed is one, and digging a deep hole at its entry. At the proper time the opening was plugged. The fish grew in the pool and were taken as needed, sometimes, for convenience, several at a time, to be kept alive in a large pot near the house. By draining the pond fish were "harvested" (p. 12). Yields varied, but villagers had the impression that they had declined considerably over a period of years.[1] In 1952, at the suggestion of FAO, the Thai government tried to increase the supply by introducing tilapia culture. During the first three years of the experiment about one-third of the families in Bang Chan had tried to raise tilapia, but in the summer of 1957 members of the research group were told that no one had persisted (see Appendix A, p. 101).

235 Eggs. - Chickens were raised by about 90% of the families in Bang Chan, and over 70% owned 10 or more. In contrast, only 37% of the households had ducks, and only 13% had 10 or more (Goldsen and Ralis, 1957, p. 56). Ducks were regarded as trouble makers. Moreover, chickens could feed "naturally" and certainly helped themselves to paddy from the bin, whereas ducks did not eat paddy, but had to be provided with bran and broken rice.

235 443 433 262 Most of the eggs produced were sold. Janlekha (1955) estimated the annual production of chicken eggs in Bang Chan as 366,540, and that of duck eggs as 268,200 eggs. According to the information which Janlekha obtained from 106 households in 1953, about 4/5 of the chicken eggs were sold as a secondary source of farm income whereas more than 3/4 of the duck eggs were home consumed. Slightly over 2/5 of all eggs produced in the village were consumed there. On a per capita basis, the average annual consumption of 708 eggs for an average family size of 5.7 persons (Janlekha, 1955) amounted to a little over 1/3 of an egg per day. Home consumption of eggs might be less in households in which enough chickens were raised to make regular sale of eggs possible. Thus in 5 of the 31 households studied by Sharp et al. (1953, p. 197) all hen's eggs produced were consumed at home.[2] For these families, an average of 452 eggs per family per year or about 1-1/4 egg per family per day, were thus available. Home consumption in the 26 families which sold eggs amounted to an average of 215 per year or about 0.6 egg per family per day. One informant commented that a rich man could eat an egg every day, but she could not afford to do so. She said she sold eggs, when she had them, and bought foods to eat with rice.

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1. Sharp et al., 1953, pp. 191-192.

2. This probably means that eggs were not sold in quantity, not that none were used in barter (cf p. 5); thus the number of eggs available may be overestimated.

235 Eggs and poultry. - Every household which took part in the survey raised chickens, and 3 of the 11 households had ducks also. In both groups of families, most of the eggs produced were sold. Home consumption of eggs on survey days was small.

228 Fish. - Each family studied had a fish pool. One family only, Household 25 in Group B raised tilapia. They began tilapia culture during the third round of the study, too late to ascertain how this might affect fish consumption in the family.

251 Preservation of Foods at Home. - Home food preservation was practiced to a very limited extent only, fish products being the principal ones produced.

Dried fish. - Families in both groups salted and dried fish throughout the year whenever they were available in excess of immediate needs.

Fermented fish. - In 10 of the 11 households, fermented fish was prepared. The 6 families in Group A had prepared a total of 30 kg., and 4 of the 5 families in Group B, a total of 29 kg. The largest amount prepared in one household, for one year was 10 kg.

Shrimp paste. - Because shrimp were caught in insufficient quantity, shrimp paste was prepared by only 6 of the 11 families. Four families in Group A prepared a total of 26 kg., and 2 families in Group B prepared a total of 7 kg. These amounts were insufficient for their needs.

Fishsoy. - One family only, in Group A, prepared fishsoy. All others in both groups purchased this product.

Buffalo meat. - During the survey year, the buffalo belonging to one family died. Some of the meat was used fresh for curry, and the remainder was salted, dried and sold.

Comparison of Caloric and Nutrient Intakes of the Two Groups With Each Other and With the Estimated Allowances.

128 146 In Table 11, the estimated calories and nutrients available to the two groups of families, are shown together with the estimated allowances.

146 On the average, the number of calories, and amounts of protein, iron, niacin and ascorbic acid in the diets of persons in Group B, the apparently better nourished group, approximated or exceeded the conservative allowances. For Group A, this was true for niacin and ascorbic acid only, the calories being 11%, protein 15% and iron 21% below the allowances.

000 Growing other kinds of green and yellow vegetables should be fostered. Although vitamin A value and riboflavin content appear to be critical, in choosing vegetables to be stressed, specialists in agriculture should consider greens [P62] with high calcium and low oxalic acid content also. A variety of edible leaves of trees were used by a few families; some used sweet basil as a vegetable rather than just a seasoning; pumpkin and sweet potato were familiar, but less often used than would be desirable. More green or yellow vegetables which mature when canals are low and aquatic plants no longer available, would be especially good. If increased production by most households[1] is not practicable, a few of the more successful gardeners might be persuaded to produce vegetables and fruits which would help to bridge the gap between rainy seasons. Mushrooms, which can be grown readily, would provide a good source of ribo- [P64] flavin when leafy vegetables are in short supply. The boom-and-bust experience in mushroom culture (See Appendix A, pp. 101-102) might, however, make its revival as a source of healthful food for home use more difficult than if the villagers did not think of mushrooms as a cash crop for which the market failed.

Eating more fruit would help to tide over the dry 262 season. Fruits were commonly used as snacks, not at meal- [264] time, hence snacks of fruit should be encouraged for adults as well as children. Bananas grew in all gardens and were available the year round. The (4)nam (4)waa variety, which was used in ceremonies, and considered safe for all, should 000 be stressed. More families could grow pineapple, which is [777] relished both raw and in curries. Mango and papaya, fruits of outstanding value for both vitamin A and ascorbic acid, would be excellent, but the idea that growing papayas is "unlucky" must be taken into account. If a few of the more thoughtful and forward-looking farmers could be persuaded to start papaya trees, even though they were not willing to plant them near the house, the practice might spread in time.

146 On the average, the Bang Chan diet did not seem to be [64] very deficient in protein, but distribution is not proportional to need, and protein deficiency may be in part responsible for periods of weight loss, or failure to gain, so 000 common among infants and children. The presence of other [136] essential nutrients in animal foods is important also. If, the local supply of fish is indeed diminishing, efforts to [228] increase it through pond culture should be continued. Abandonment of tilapia culture in Bang Chan, after about one-third of the families had tried it, (Appendix A, p. 101) suggests that not enough of the right kind of help was given

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1. Tenant farmers may not be permitted to enlarge gardens by mounding at the expense of rice fields.

concerning its culture and use. Tilapia culture was learned largely by trial and error, and was considered primarily as a source of extra cash. If it had been regarded also as a means of improving health through increasing the family's food supply, and if the homemaker had been shown how to use this unfamiliar fish in familiar ways, the outcome might have been different. Increased use of fermented fish and of small dried fish which are eaten whole, should be encouraged. So long as the ability of human beings to adapt to such low calcium intakes without harm has not been proved, any feasible means of increasing the calcium content of the diet seems worth trying.

More home consumption of eggs would be desirable, but their ready sale and acceptability for barter may present an obstacle to increased home use. Increased production would probably lead to some increased home use at least at the peak season. Duck eggs which are less often sold, might be stressed both for this reason, and because of their greater size. The idea held by some that eggs are not good for children nor for pregnant women should be countered when possible. Since hard cooked eggs have many ceremonial uses, they might be presented as "strengthening" food. Hard cooked eggs, which could be prepared the night before, would be convenient as breakfast for workers who would otherwise go to the field without food, for lunch to be carried to the field or to school, and for occasions when parents are to be away from home, as at a ceremonial, and should leave food at home for children.

Milk, as canned, dried or malted milk preparations, was considered an appropriate gift for the priests, who are forbidden to eat solid food after the 11 a.m. meal. Some of this may be shared with the temple boys. The respected old ladies and others who stay overnight at the temple on the Buddhist holy day, and who observe the same rules as the priests for this time, also like to drink milk, often with coffee. Perhaps the wat committee could be taught how dried or canned milk should be reconstituted, and could direct that this be done. They could both spend some of the cash offerings for milk and encourage those who buy gifts of food for the priests to include milk among them. People gladly bought food for the priests and would probably accept on the authority of the head priest or respected elders, the idea of buying certain foods of high nutritive value, even though these cost more. If a small group of leaders, such as the wat committee or the hamlet headman were instructed in the dangers of contaminated water and the values of good food, with the implication that the best available should be offered the priests both daily, and on ceremonial occasions, improved practices might spread to home consumption, since most food is prepared in the home.

The importance of merit making and the relatively large cash expenditures involved in ceremonials, will probably influence acceptance of any improved practices which involve cash outlay. If some leaders were interested in dietary

Notes on Tilapia Culture in Bang Chan

228 654 In 1952, the Thai government, at the suggestion of FAO, began to encourage tilapia culture. Fingerlings and some information on tilapia culture could be obtained from the Minburi district office, where a demonstration pond was maintained. Early in 1953, we learned from the records of the district officer that three persons in Bang Chan, two of them hamlet headmen, had obtained tilapia from this source. In 1953 the commune chief called a meeting in the village and explained the importance of tilapia raising. In May 1955 when Ralis conducted a survey in Bang Chan (Goldsen and Ralis, 1957), tilapia raising had been tried in nearly a third (31%) of the households, but was considered by 2/3 of the respondents to pay little.

The authors comment:

> From discussions with the people it appears that they are learning by trial and error to raise tilapia. Though fish culture is, for them, mainly a sideline activity, nevertheless, it requires the building of a special dam, care in preventing other fish from devouring young tilapia and maintaining the appropriate balance of fresh water in a given pool. The loss resulting from the fish dying or being eaten by others is relatively high. Although tilapia multiply [434] rapidly, the cash return is not as great as that realized from mushroom growing. The cycle of raising tilapia lasts about four months.

From the comments just quoted, tilapia culture appears to have been undertaken for the anticipated cash return. No [114] information was obtained by Ralis concerning the extent to which the villagers used tilapia to increase their supply of fish for home use. In the summer of 1957 members of the research group who visited Bang Chan found that no one was raising tilapia; they were neither a source of food nor of cash. Some indication was obtained that their flavor and texture were not agreeable. Clearly the attempt to introduce a rapidly growing but unfamiliar variety of fish failed in Bang Chan. An understanding of the reasons for this failure might help to prevent other costly failures in future.

Notes on Mushroom Culture in Bang Chan

177 244 Goldsen and Ralis (1957) commented as follows:

> Three years ago the commercial growing of mushrooms in Bang Chan was unknown. By 1955, the practice of growing mushrooms had reached into many homes (44 per

3. Tilapia raising. In 1951, FAO suggested to the Thai Government that cultivation of tilapia be encouraged to help meet the rising need for fish in Thailand. Tilapia is a species of fish which multiplies and grows relatively fast. The strain, which came originally from Africa, is popular in Malaya and was expected to be easily marketable, thus a source of added income in Thailand. The Thai Government followed the FAO suggestion in 1952: a few Bang Chan residents dug the special pools required for the fish culture and began to raise tilapia mainly for commercial purposes. About a third (31 per cent of the households*) reported in 1955 that they have engaged in this activity. 177* 178* 228*

From discussions with the people it appears that they are learning by trial and error to raise tilapia. Though fish culture is, for them, mainly a sideline activity, nevertheless, it requires the building of a special dam, care in preventing other fish from devouring young tilapia and maintaining the appropriate balance of fresh water in a given pool. The loss resulting from the fish dying or being eaten by others is relatively high. Although tilapia multiply rapidly, the cash return is not as great as that realised from mushroom growing. The cycle of raising tilapia lasts about four months. [434]

4. Artificial fertilizer. Artificial fertilizer has made its appearance in Bang Chan only recently. Informants in the community reported that only two farmers had tried artificial fertilizer in 1952. In the 1955 survey, 12 per cent of the farmers reported that they have used fertilizer or are using it. This fertilizer is mainly ammonium sulphate sold both by the government and commercial distributors. Only a few farmers (3 per cent) have ever employed it for all, or for the larger part of their fields. The remainder (9 per cent) have used it on a trial basis in only a small part of their fields.** 241 197* 178*

Fertilizer, then, has been tried out on a much smaller scale than either mushroom growing or raising tilapia. Apparently two important barriers operate against its wider acceptance. First, its high cost and the difficulty of purchase and transportation (66 per cent of farmers with ideas on the subject gave these reasons for not using fertilizers); second, popular opinion in Bang Chan declares that artificial fertilizer is not fit for low lands since it washes away and is thus wasted (29 per cent of the farmers with ideas on the subject advanced this as reason for not using fertilizer). In addition, fertilizer yields delayed returns.

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* The question: "Have you ever raised tilapia, or not?" [125]

** The question: "Have you ever used fertilizer or not? .. To what extent have you used fertilizer on your fields?" [125]

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TABLE 1. THOSE WHO OWN OR USE SMALL MOTOR ARE MORE LIKELY THAN OTHERS TO TRY OTHER AGRICULTURAL INNOVATIONS (FARMERS ONLY)

	Owns motor	Does not own motor but uses it	Neither owns nor has used motor
(Total cases)*	(70)	(150)	(106)
Have you ever used fertiliser?**			
Yes	18%	10%	3%
No	82	84	97
Have you ever raised tilapia?			
Yes	53%	29%	22%
No	47	71	78
Have you ever grown mushrooms?			
Yes	40%	49%	37%
No	52	51	64

[125]

* The bases on which per cents are computed appear in parenthesis at the head of each column in this and subsequent tables. Actually the bases vary by a few cases, table to table, since there were always a few respondents who did not answer a given question or whose answers were unclassifiable.

** Asked of farmers only. The bases are:

Owns motor	65
Does not own motor but uses it	141
Neither owns nor has used motor	82
NA	5

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There is some evidence, then, that if a person is willing to try out one agricultural device, such as the motor, he is more likely to try out other agricultural innovations. However, this "clustering" cannot support the hypothesis that there is something like "innovation mindedness" in general, or that acceptance of any innovation in a series is predictive of acceptance of all other innovations in the same series.

Evidence may be cited to substantiate this contention. In the first place, if such a clustering indeed prevailed, one would expect users of any of these agricultural innovations to be more disposed than others to use, as well, certain non-agricultural innovations, such as hospital or clinic facilities, for example.

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• 228 And no such tendency may be discerned in the present data. (See Table 2.)
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182 TABLE 2. USERS OF HOSPITAL AND CLINIC FACILITIES SHOW NO SIGNIFICANT DIFFERENCES IN RATES OF ACCEPTANCE OF AGRICULTURAL INNOVATIONS

Agricultural Innovations	Percentage who have ever gone to hospital or clinic for treatment	Total cases
Mushrooms		
Tried them out	36%	(143)
Never did	38	(188)
Tilapia		
Tried it out	44%	(104)
Never did	34	(223)
Motor		
Tried it out	37%	(213)
Never did	36	(106)
Fertilizer*		
Tried it out	37%	(32)
Never did	34	(232)

* Farmers only

228 In the second place: use of the motor is much less strongly
241 linked to use of mushrooms than the use of fertilizer or tilapia.
244 It may well be that there may be some common factor strongly underlying the decision to use the motor on the one hand, fertilizer and tilapia on the other, while the decision to try mushroom-growing is relatively more "autonomous". A possible explanation for the
402 greater "autonomy" may be sought in the differential requirements
*177 for growing mushrooms compared with the requirements for adopting
*178 the other innovations.

Both tilapia and sulphates demand extra heavy work, care, an essential initial investment, and willingness to wait for a delayed return. An additional requirement for a successful and continuous pay-off from both these innovations may be an aptitude to follow rather complicated instructions. In the case of mushroom growing, however, the initial investment is relatively small, the labor may be tedious but is not heavy, no protracted or complicated care is involved, and the results of the effort are relatively quickly realizable.

There is some justification, then, for the inference that initial adoption of innovations such as fertilizer and tilapia, which require increased labor, will depend to some extent upon the availability of some labor-saving device (such as the small motor) which will enable the busy farmer to perform the necessary labor and, perhaps, leave him freer to exercise the care required for these innovations to be successful. Hence the relatively stronger relationship among these innovations. An innovation which does not make these demands, however (such as mushroom growing), is more likely to find acceptance on its own terms and may thus be less dependent for its acceptance upon availability of some sort of labor-saving device.

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Innovation and Attitude Towards It

There is further evidence in the survey substantiating the greater "autonomy" so to speak, of the decision to try mushroom culture compared with the decision to try fertilizer or tilapia.

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The present study tested the hypothesis that use of these innovations would be related to a favorable attitude toward them. Attitude toward the four innovations was determined by examining responses to the questions: "What is your opinion about fertilizer?" "...about mushroom growing?" "...about tilapia?" Responses were classified according to whether they revealed positive, mixed, or negative affective feelings to each of the innovations.

In general, positive attitudes towards all these innovations are widespread in Bang Chan. About three-quarters of the residents express positive feelings toward mushroom growing and over half express positive attitudes to artificial fertilizer and tilapia raising. (See Table 3.) None of these innovations elicits widespread expressions of disfavor, although the respondents are more likely to express an unfavorable attitude to tilapia (29 per cent) than to fertilizer (14 per cent) or to mushrooms (7 per cent)

TABLE 3. THE MAJORITY IN BANG CHAN HOLD POSITIVE ATTITUDES TOWARDS AGRICULTURAL INTRODUCTIONS

Attitude	"What is your opinion about..." Mushrooms	Fertilizer	Tilapia
Positive	76%	59%	57%
Neutral or mixed*	6	3	2
Negative	7	14	29
No opinion	9	16	8
Not ascertainable	2	8	4
Total cases	(333)	(333)	(333)

* The neutral or mixed attitude category comprises responses conveying partly favorable and partly unfavorable feelings such as, "some kind is good, some kind is not so good"; "in some ways I like it, in some ways I dislike it."

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Now let us examine the extent to which the decision to try out the innovation is linked to a positive feeling towards it. The decision to try fertiliser and to raise tilapia turned out to be indeed linked with positive feelings towards these innovations. Among those favoring fertiliser, the proportion using it is six times as high as those with neutral, mixed or negative attitudes (18 versus 3 per cent); among those with positive attitudes to tilapia raisers of this fish are twice as frequent in comparison with those having neutral, mixed, or negative attitudes (43 versus 22 per cent). These relationships are shown in Table 4 below.

TABLE 4. ATTITUDES TO FERTILIZER AND TILAPIA RAISING ARE LINKED TO THEIR USE

	Attitude	
	Positive	Neutral, Mixed & Negative
Fertiliser		
Tried it out	18%	3%
Never did	82	97
Total cases*	(168)	(33)
Tilapia		
Tried it out	43%	22%
Never did	57	78
Total cases	(191)	(104)

[125] * Based on responses made by 293 farmers who expressed a codable attitude to fertiliser.

244 On the other hand, the data revealed no relationship between
*177 attitude to mushroom growing and growing them. The proportion of
*178 users and former users among those who have favorable attitudes and those who have negative attitudes remains relatively constant. Table 5 shows that among respondents with positive attitudes, per cent have tried mushroom growing; while among respondents with negative attitudes, 42 per cent have done so; percentage differences are statistically insignificant.

TABLE 5. ATTITUDES TO MUSHROOM GROWING SHOW NO RELATION TO ITS ADOPTION

	Attitude	
	Positive	Neutral or Negative
	(252)	(42)
Tried mushrooms	47%	42%
Never did	53%	58%

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It appears, then, that we may be dealing with two types of innovations, one type (fertilizer and tilapia) where attitude is linked to decision to use it and another (mushrooms) where attitude seems to be unrelated to such use.* And here again may be further substantiation of the greater autonomy of the acceptance of mushroom growing. For, in the case of innovations such as artificial fertilizer and tilapia, it is known that they require investment of funds and labor, risk, delayed return, and departure from well-known ways. It could be that in the face of these disadvantages acceptance will occur only if motivation is high. Acceptors would then be selected mainly from among those who have high motivation and accompanying positive affective feeling. Those who do not have these feelings would, following this reasoning, be less likely to overcome their objections to the disadvantages of the innovation in question.

There is also the second type of innovation like mushroom growing. This innovation is much less "costly" not only of funds but effort. Hence, high motivation and accompanying positive affect might be less influential than other factors--factors quite aside from the crop itself--on acceptance of this type of innovation. Consequently, growers of mushrooms may be recruited equally from persons with favorable attitudes and less favorable attitudes towards this crop.

These findings suggest the more general hypothesis (which might be corroborated by analysis of related contextual data collected in Bang Chan, and by examining equivalent situations in other underdeveloped areas) that: the more complex the innovation, the more effort involved in employing it, the more risk involved, and the less immediate the return, the greater the likelihood that acceptors will be recruited from a selected group of highly motivated people, rather than at random among all persons "eligible" to accept it. If the innovation requires the high motivation which is needed to overcome the disadvantages of investment, work, risk, and rarity, then this attitude toward it is important. If the innovation demands only short-term investment and relatively light labor, then this motivation is of little importance in the decision to try it.

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Sociological Factors in Agricultural Innovation

The decision to use the small motor, once made, tends to accelerate the decision to try out other agricultural innovations, especially fertilizer and tilapia and, to a lesser extent, even mushrooms.

• Both mushroom growing and tilapia raising are sideline activities to the Bang Chan rice farmer and are, therefore, comparable in this respect.

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• 228 mushrooms. The following section searches for sociological factors
241 linked to these decisions. For example, are the well-to-do farmers*
244 more apt than the less well-to-do to adopt agricultural innovations? To what extent is literacy a factor in acceptance of innovations? To what extent do differences in literacy, communications habits, cultural contacts and urban orientation account for tendencies to adopt or reject these changes?

[125]* The following analysis has been made, in most cases, for male farmers only. The distribution of initial acceptance among the three groups of male farmers, females, and male non-farmers is given in the following table.

*179
*178 TABLE 6. USE OF AGRICULTURAL INNOVATIONS AMONG THREE GROUPS OF BANG CHAN VILLAGERS

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	Male Farmers (211)	Male Non-farmers (82)	Females (32)
Tried motor	71%	61%	48%
Didn't try	29	39	52
Tried mushroom growing	46%	35%	41%
Didn't try	54	65	59
Tried tilapia raising	35%	25%	31%
Didn't try	65	75	69
Tried fertilizer	15%	5%	**
Didn't try	85	95	

** Asked of farmers only.

It is apparent, as one would expect, that it is mainly the farmers who try these innovations. Relatively few women (with the exception of tilapia raising) and even fewer non-farmers say they have tried them. Since the absolute number of acceptors among women and non-farmers is too small to bear the separate treatment which would be essential to analyse the factors influencing the use or non-use of innovations, they have been excluded from the following presentation, which refers, thus, to male farmers only.

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Decisions to use all these innovations--with the possible exception of the use of fertilizer--seem to be more widespread among the upper economic levels of the population. (See Table 8.) One wonders whether the initial link between use of the motor and readiness to try the innovations may actually disguise a more basic relationship based simply on ability to afford the investment and the risk.

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TABLE 8. FARMERS* ON HIGHER SES LEVELS ARE MORE LIKELY THAN OTHERS TO HAVE USED THE MOTOR, TO HAVE GROWN MUSHROOMS AND TO HAVE RAISED TILAPIA

	Ownership of Buffaloes	
	2 or less (99)	3 or more (112)
Used motor		
Own	6%	37%
Use	53	45
Neither	41	18
Grew mushrooms		
Yes	30%	60%
No	70	40
Raised tilapia		
Yes	26%	42%
No	74	58
Used fertilizer		
Yes	12%	17%
No	78	83

* Male farmers only

The following table presents again the initial relationships between use of motor and readiness to try out other innovations. But this time the link is examined separately for persons on the different economic levels.

Table 9 was made by first dividing the population into two groups, those from high and those from low economic levels. The resulting two groups were then further subdivided on the basis of whether they owned (or used) a motor or whether they did not. In each of the four resultant groups the percentage that raised tilapia was then calculated. Thus among those of high economic level who own or use motors, 43 per cent raised tilapia, and we infer that 55 per cent did not raise tilapia. The same procedure was repeated to ascertain the percentage that has tried fertilizer and subsequently the percentage that has tried mushroom growing.

This table shows that in tilapia raising both factors operate independently and cumulatively, i.e. people who are better off economically and who also own or use the motor are almost two and a half times as likely to raise tilapia as their economically depressed counterparts who neither own nor have access to the motor. (45 versus 17 per cent respectively.)

The link between use of the motor and attempt to try fertiliser holds regardless of economic level.

The initial link between ownership or use of the motor and growing of mushrooms, on the other hand, is shown to be a conditional one. Those on a higher economic level are more likely than others to try mushroom growing, whether or not they own or use a motor. Those on the lower economic level, with access to a motor are more likely to take up tilapia culture.

TABLE 9. RELATIONSHIP OF USE OF MOTOR AND OTHER INNOVATIONS TO ECONOMIC LEVEL

	Economic Level			
	High*		Low**	
Owns or used motor (Proportion who have raised tilapia)				
Yes	45%	(89)	33%	(57)
No	25	(21)	17	(40)
Owns or used motor (Proportion who have tried fertiliser)				
Yes	20%	(89)	18%	(57)
No	5	(21)	*	(40)
Owns or used motor (Proportion who have tried mushroom growing)				
Yes	60%	(89)	38%	(57)
No	57	(21)	23	(40)

* Three buffaloes or more
** Two buffaloes or fewer

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Literacy

One important hypothesis to account for differential acceptance of innovations is that the decision to try them out is aided by exposure to the available sources of information. If this were indeed the case, then users of these innovations will be more apt to be able to read and write than be illiterate.

Literacy was determined by asking each respondent whether

125 he could write, could only sign his name, or could do neither.* Those who said they could write a letter are considered here to be 212 literate. All others are grouped together as illiterates or on a low level of literacy.

212 The literacy rating was tested for validity as follows: in 872 Bang Chan literacy is known to be related to age. Ever since 125 1935** there has been a school in the community. Since that date school attendance has been compulsory. Attendance has been fairly full for the last twenty years, but most older residents have never had the opportunity for formal schooling.

212 The survey data reflect this correlation between literacy and *177 age. Among farmers under 40 years of age, only 16 per cent were *178 rated as illiterate or barely literate by the survey criterion; 561 while 59 per cent of those of 40 years or older are rated as illiterate. Thus one can have reasonable confidence in the survey response as a rating of literacy.

TABLE 10. LITERACY OF FARMERS DECREASES WITH AGE

	Age	
	Under 40 yrs.	40 yrs. or more
Literacy		
Illiterate	16%	59%
Literate	84	41
Total cases	(79)	(131)

*177 Literacy is linked discernibly to acceptance of the motor and *178 mushroom growing. The proportion of literate farmers who have tried the motor is twice as high as the corresponding proportion 228 among those who are illiterate. It is less strongly linked to the 241 decision to grow mushrooms, and is, at best, weakly linked to the 244 decision to raise tilapia or to use fertilizer.

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212 * In addition, interviewers asked respondents who said they could write to demonstrate it by writing something on the ques- 402 tionnaire.

[125] ** See Siamese Rice Village, op. cit.

TABLE 11. LITERATE FARMERS* ARE MORE LIKELY TO HAVE USED THE MOTOR AND TO HAVE TRIED MUSHROOM GROWING

	Illiterate (Cannot write a letter) (92)	Literate (Can write a letter) (118)
Motor		
Own	16%	26%
Use	35	60
Neither	48	14
Mushrooms		
Have tried	38%	53%
Have not	62	47
Fertilizer		
Have used	12%	17%
Have not	88	83
Tilapia		
Have tried	29%	39%
Have not	71	61

* Male farmers only

If Bang Chan were like certain areas of the United States and Europe, it might be objected that such a relationship between acceptance of innovations and literacy reflects a spurious link with economic level: that illiterates tend to come from the economically deprived strata of the population; hence an observed relationship with literacy may actually reflect the initial correlation with economic level. In Bang Chan, however, this is not the case. A Bang Chan farmer who is well-to-do is as likely to be illiterate as literate, as is illustrated by the table below.

TABLE 12. LITERACY AND ECONOMIC LEVELS ARE UNRELATED IN BANG CHAN*

	Literacy	
	Low (91)	High (119)
Economic Level		
Low	48%	56%
High	52	44

* Male farmers only

Hence the correlation between use of innovations and literacy may be taken at face value and does not reflect a spurious link with economic level.

Communications Media

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* 178
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With the increasing use of mass communications, the community member is exposed to sources of information other than the printed word. Ownership of radios has nearly tripled in about five years (in the 1955 survey radios were reported in 14 per cent of the households, whereas in 1949* only 5 per cent of the households reported owning a radio). Quite apart from ownership, radio listening is widespread; less than one-fifth of the people in Bang Chan claim they never listen to the radio (18 per cent). Motion pictures are also popular. Only one-tenth claim to having never attended a movie, while half (49 per cent) say they have seen motion pictures more than ten times.

There is, of course, a strong relationship between exposure to one of these media and exposure to the other. Table 13 below indicates that the majority (64 per cent) of respondents who listen to the radio likewise report frequent movie attendance. Similarly, the majority (67 per cent) of those who say they never listen to the radio, reported that they go to movies rarely or never.

TABLE 13. EXPOSURE TO RADIO AND MOVIES SHOWS HIGH INTERRELATION

	Radio Listening		
Movie Attendance	High Exposure (regular or occasional listeners) (111)	Low Exposure (listen seldom) (148)	No Exposure (60)
High exposure (10 times or more)	64%	52%	12%
Medium exposure (4 to 9 times)	19	17	21
Low Exposure (0 to 3 times)	16	31	67

[402]
[241]
• [228]
[244]

Exposure to the communications media is strongly linked to acceptance of a basic innovation such as the motor. It is not directly linked to acceptance of the other agricultural innovations (fertilizer, tilapia, mushrooms). Respondents who report frequent exposure to radio listening and motion picture attendance are significantly more likely than others to say they own or have used the motor. (Among daily radio listeners 88 per cent report use of the motor; and this proportion declines steadily until among those who never listen, only 46 per cent use the motor; for movies, the corresponding proportion of users ranges from 76 to 36 per cent.)

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* Siamese Rice Village, op. cit.

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TABLE 16. INHABITANTS WHO HAVE ADOPTED URBAN EATING PATTERNS ARE MORE LIKELY THAN OTHERS TO BE EXPOSED TO MASS COMMUNICATIONS AND URBAN CONTACTS

	Eating Pattern	
	With hands (342)	With fork and/or spoon (84)
Listens to radio		
Regularly (daily)	10%	25%
Occasionally	17	38
Seldom	51	35
Never	22	10
Has seen a movie		
Ten times or more	40%	72%
4 - 9 times	19	17
1 - 3 times	28	10
Never	13	1
This past year, how many times did you go to Bangkok?		
None	26%	7%
Once	18	13
2 - 4 times	29	23
5 or more times	28	55

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[241]
[244]
[402]
[228]

When acceptance of urban influences is measured even on the basis of this index, the evidence is clear that it is linked with acceptance of the agricultural innovations. Those responsive to urban influence are twice as likely as others to use fertiliser (21 per cent versus 9 per cent), one and a half times as likely to grow mushrooms (57 per cent versus 39 per cent), and one and a quarter times as likely to use a motor than the others (82 per cent versus 61 per cent). There is no noticeable relationship, however, between tilapia raising and responsiveness to urban influences. The respective proportions are shown in Table 17.

[212]
[434]

These relationships between acceptance of urban patterns and decision to use certain innovations remain constant for those on high as well as low economic levels and also for the literate as well as illiterate farmers.

*178
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as ept to adopt the motor irrespective of whether he has been in contact with urban culture.

TABLE 20. ILLITERATE FARMERS* WITH WIDER CULTURE CONTACTS ARE MORE LIKELY THAN OTHERS TO USE THE MOTOR

	Illiterate (Proportion using the motor)		Literate (Proportion using the motor)	
Trips to the airport				
None	38%	(40)	86%	(35)
One or more	63	(49)	86	(83)
Visits to the agricultural fair				
None	50%	(67)	85%	(76)
One or more	57	(24)	88	(43)

[562]
[241]
[228]
[244]

*Male farmers only

However, no such relationship was discerned between these culture contacts and trying out either fertiliser, tilapia, or mushrooms.

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Here again, is evidence to support the hypothesis that contacts with urban culture may act as a substitute for literacy in making the farmer more sophisticated about improving his standard of living and level of production. But the data show that such exposure need not result from direct physical contact with urban centers; it can, instead, be a result of indirect contact. Direct physical contact with urban culture, it turns out is effective in increasing the incidence of acceptance of the more complex innovations only for the illiterate farmers of Bang Chan.

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Friendships

The same reasoning which would lead one to expect a higher incidence of acceptance of innovations among those directly exposed to urban contacts would lead to the companion hypothesis: that inhabitants who have a greater degree of internal contacts with their friends and neighbors might tend to try out innovations to a greater extent than those who remain relatively aloof from such social contacts.

[402]
[228]
[241]
[244]

The data show that such contacts have a limited connection with acceptance of innovations. The incidence of motor use and tilapia raising is higher, it is true, among persons who report a wider sphere of social circulation; but there is little relation between social contacts and willingness to try out fertiliser or mushrooms.

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[125]

TABLE 21. INCIDENCE OF MOTOR USE IS HIGHER AMONG VILLAGERS WHO REPORT WIDER SOCIAL CONTACTS

	Social Contacts ("...Do you have more close friends than most people around here, or about the same as most people around here, or fewer close friends than most people around here?")	
	"More" or "the same" (143)	"Fewer" (55)
Motor		
Has used it	77%	55%
Never did	23	45
Tilapia		
Has tried it	39%	21%
Never did	61	79
Fertilizer		
Has used it	16%	11%
Never did	84	89
Mushrooms		
Has tried them	49%	40%
Never did	51	60

[212]

Once again, however, when this link between breadth of social contacts and use of the innovations is examined separately for the literate, compared with the illiterate farmers, we find further substantiation of the previous finding that under certain circumstances contact may act as a substitute for literacy in acceptance of complex innovations. For, although the link between social contacts and use of tilapia remains constant for literate as well as illiterate farmers, it is mainly for those who are illiterate that exposure to wider local social contacts is associated with greater incidence of motor use.

6: Goldsen and Ralis Z-4.5 (1955) 1957
AO7 Central Thai AO7

*178
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TABLE 22. AMONG ILLITERATE FARMERS USE OF MOTOR IS LINKED TO WIDER SOCIAL CONTACTS

	Exposure to Influence of Others: Have more friends or about the same		Have fewer friends	
	(Proportion who tried small motor)			
Literacy				
Illiterate	64%	(56)	26%	(27)
Literate	87	(86)	86	(78)
	(Proportion who tried tilapia)			
Illiterate	34%	(56)	15%	(28)
Literate	43%	(86)	26	(27)

[369] This finding corroborates and expands the previous discussion of the culture contact and acceptance of innovations. Exposure to influence of others from outside the community (through contact with the city, with the airport, with the agricultural fair, for example), as well as exposure to the influence of others from within (through friends and associates) clearly relates to the decision to use an innovation such as the motor. Its effectiveness is not felt equally by the whole population, mainly instead, by those who are illiterate.

The significance of these internal and external contacts to illiterates may be that through such contacts they are likely to gain needed information and motivation which, if one can read and write, is available through other sources. If one cannot read and write, however, it is the outside world which provides this kind of needed information.

Capital Investment and Debt

426 Bang Chan's economy is largely a money economy and many farmers avail themselves of credit facilities through professional money lenders. Most loans are sought for the purpose of replacing capital equipment and purchasing land and buffalo.*

The present survey secures a rough measure of the extent of such borrowing in Bang Chan. The majority of farmers (59 per cent)

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[113] * See Janlekha, Kamol O. A Preliminary Study of the Economic Conditions of Siamese Rice Farmers in Bang Chan, Thailand. M.S. Thesis Cornell University, 1951, p. 75.

admit in response to a direct question* that they have a debt. Confidence in the validity of these responses as an index of indebtedness is increased since the expected correlation between indebtedness and ownership of buffalo is reflected in the survey data.

TABLE 23. INCIDENCE OF REPORTED DEBT IS HIGHER AMONG VILLAGERS WHO REPORT OWNERSHIP OF MORE BUFFALOES

	Reported Ownership of Buffaloes		
	None (81)	One to three (155)	Four or more (97)
"...Do you now have a debt?			
Yes	49%	56%	69%
No	51	44	31

When the use of agricultural innovations is examined for those farmers who say they have a debt, compared with those who deny it, it becomes apparent that there is a relationship only between indebtedness and use of the motor but not with any of the other mentioned innovations. Seventy-nine per cent of the male farmers who said they have a debt own or use the motor; among those who claim they have no debt the proportion owning or using the motor is significantly less (60 per cent).

TABLE 24. INCIDENCE OF MOTOR USE IS HIGHER AMONG FARMERS WHO REPORT INDEBTEDNESS

	"...Do you now have a debt?"**	
	Yes (125)	No (85)
Motor		
Has used it	79%	60%
Never did	21	40
Tilapia		
Has tried it	37%	33%
Never did	63	67
Fertilizer		
Has used it	14%	16%
Never did	86	84
Mushrooms		
Has tried them	43%	48%
Never did	55	52

**Male farmers only

* The question: "...I'd like to ask about a problem common in rural places all over the world. Do you now have a debt or not?" Janlekha's M.S. thesis, ibid., reports a similar distribution of indebtedness for his sample of 98 farmers.

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Use of Health Facilities and Other Factors Associated With Agricultural Innovations

Although use of the basic agricultural innovations was shown to be linked to breadth of contacts within the community, on the one hand, and to indebtedness, on the other hand, the association between these factors and use of modern health facilities, although showing the same tendency, is not statistically significant. For the sake of completeness, the figures are reported below:

TABLE 34. NO RELATIONSHIP BETWEEN INDEBTEDNESS OR INTERNAL SOCIAL CONTACTS AND USE OF HOSPITALS AND CLINICS

	"Have you ever been to a clinic or a hospital?"			
	No, Never	Yes, for treatment	Yes, for other reasons	Total 100%
Social Contacts				
"More friends"	31%	35%	34%	(62)
"The same"	40	35	25	(154)
"Fewer friends"	32	41	27	(94)
Do you now have a debt?				
No	40%	32%	28%	(140)
Yes	33	41	26	(192)

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SUMMARY

1. In the community of Bang Chan in Central Thailand, various factors are studied statistically in order better to determine the conditions of acceptance of selected agricultural innovations and conditions for using the facilities of modern medicine in clinics and hospitals. Four agricultural innovations were selected, viz. gasoline motor, raising of fish (tilapia), use of fertilizer, and mushroom culture.

2. The present study was concerned with the initial adoption or trial of innovations, rather than the continuing use of these innovations or the merging of the new with the old features of the culture.

3. While adoption of the gasoline motor was associated with all other agricultural innovations, no generalized acceptance of the new was found because: a) adoption of the gasoline motor bore little or no relation to use of non-agricultural innovations such as hospital and clinic facilities; and b) adoption of gasoline motors was only weakly associated with raising of mushrooms.

4. A cluster of traits including high motivation and sizable capital outlay was associated with the use of the gasoline motor.

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The motor users formed a group with higher economic level, greater literacy, higher acceptance of urban ways of life, more frequent exposure to mass media, broader social contacts within the community, and greater use of credit facilities. Illiterate farmers might also be motor users, if their contacts with urban centers were extensive.

5. Acceptance of mushroom culture was a special case of agricultural innovation: a) as distinct from all other attitudes toward innovation, mushroom growers were not marked by their high positive attitudes toward mushroom culture; b) the investment in mushroom raising per se was less than the investment and risk required by other types of agricultural innovation.

6. The mushroom growers as a group distinct from non-mushroom growers were more literate and acceptive of urban ways. Tilapia raisers were of a higher economic level and had greater community contacts than non-tilapia raisers.

7. An hypothesis was offered: that innovations differ in complexity and investment of effort required. The more complex presuppose greater investment, work, risk and postponement of returns; hence this complex kind requires greater motivation than the simpler ones such as mushroom raising.

8. Use of hospital and clinic facilities was more frequent among the literate, those exposed to mass media, those accepting of urban ways and those having greater contacts with the city. Unlike acceptors of agricultural innovations, users of modern medical facilities were not of a higher economic level than non-users and could not be clearly distinguished on the basis of breadth of contact within the community or use of credit facilities.

7. I understand that, since the last war, there have been, around here, some introductions of new things in the field of rice farming, other farming, gardening, and fishing in order to raise production. What are these various new things? [177*] [178*] [125]

1.	Fertiliser	9	
2.	Small engine	4	
3.	New rice seeds	3	[241]
4.	Tilapia	98	[402]
5.	Other fish, specified	13	[243]
6.	Fish, unspecified	80	[228]
7.	Mushrooms	45	
8.	Poultry	179	[244]
9.	Pigs	21	[235]
X.	Other, specify	68	[231]
0.	Unascertainable	45	

8. Here, some farmers get a lot more rice from one rai of land than others get. Generally speaking, what are the various reasons why this is so? [243] [433]

1.	Fertiliser	59
2.	Skill of the farmer	63
3.	Quality of the soil	65
4.	Irrigation facilities	125
5.	Type of seed	17
6.	Other reason, specify _____	53

9.a. When was it more profitable for you to grow rice, this year just finished, or two or three years ago? [243] [434]

1.	This past year	131
2.	No difference	57
3.	2 or 3 years ago	62
4.	Unascertainable	25
—	Does not apply	58

b. If 2-3 years ago: If this is so, then it has become less profitable to grow rice. Such being the case, have you done anything to improve the income of your family?

7.	Yes	36
8.	No	25
9.	Unascertainable	1

c. If yes: what various things have you done?

5.	Nothing	4
6.	Mushrooms	6
7.	Poultry	8
8.	Fish (Incl. Tilapia)	5
9.	Fertiliser	
X.	Other, specify _____	25
Y.	Unascertainable	2

10.a. Do you own a small engine motor, or not? [402]

1.	Yes	70
2.	No	259
—	No Answer	4

125
[402] b. If no: have you ever made use of one in your work, or not?

3. Yes	145
4. No	106
5. Unascertainable	8

11. What is your opinion about fertiliser?
(See code at end)

[241] 12.a. IF R IS A FARMER: Have you ever used fertiliser or not?

6. Does not apply	17
7. Yes	32
8. No	232
— No Answer	12

b. IF HAS NOT USED FERTILIZER: For what various reasons have you not used fertiliser?
(See code at end)

c. IF HAS USED FERTILIZER: Have you ever used fertiliser in your seed-beds, or not?

9. Yes	20
X. No	13

d. IF HAS USED FERTILIZER: To what extent have you used fertiliser on your fields? On all your fields, or on the larger part of your fields, or on the smaller part of your fields?

1. On all fields	4
2. On larger part of fields	4
3. On minor part of fields	24
4. Unascertainable	1

13. What is your opinion about mushroom growing?
(See code at end)

[244] 14.a. Have you ever grown mushrooms, or not?

1. Yes	143
2. No	188
— No Answer	2

b. IF NO: Do you have any relatives or relative-like neighbors, who have grown mushrooms or not?

3. Yes	141
4. No	44
5. Unascertainable	4

15.a. What is your opinion about tilapia raising?

[228] b. Have you ever raised tilapia, or not?

1. Yes	104
2. No	225
— No Answer	4

16.a. ASK ONLY FARMERS: This year just now beginning, will you do anything for increasing your income, outside of rice farming? [125] [434]

3.	Does not apply	13
4.	Yes	162
5.	No	107
6.	Unascertainable	11

b. IF YES: What various things will you do? [224] [235] [228] [241]

0.	Nothing	3
1.	Mushrooms	42
2.	Poultry	51
3.	Fish (Incl. tilapia)	10
4.	Fertiliser	2
5.	Other, specify_____	84
6.	Unascertainable	6

17. ASK ONLY FARMERS:

a. Last time you planted rice, how many rai of rice did you plant? [243] [433]

1.	4 rai or less	14
2.	5 to 9 rai	25
3.	10 to 19 rai	49
4.	20 to 29 rai	65
5.	30 to 39 rai	53
6.	40 to 49 rai	32
7.	50 to 59 rai	19
8.	60 to 69 rai	14
9.	70 to 79 rai	2
X.	90 rai or more	—
0.	Unascertainable	20

b. And what was the total yield?

1.	120 tang or less	15
2.	121 to 300 tang	28
3.	301 to 600 tang	59
4.	601 to 900 tang	59
5.	901 to 1200 tang	56
6.	1201 to 1500 tang	25
7.	1501 to 1800 tang	10
8.	1801 to 2100 tang	10
9.	2101 to 2700 tang	7
X.	2701 or more tang	3
0.	Unascertainable	21

c. How about the year before--how many rai did you plant?

1.	4 rai or less	16
2.	5 to 9 rai	19
3.	10 to 19 rai	51
4.	20 to 29 rai	67
5.	30 to 39 rai	53
6.	40 to 49 rai	26
7.	50 to 59 rai	20
8.	60 to 69 rai	13
9.	70 to 89 rai	5
X.	90 rai or more	—
0.	Unascertainable	23

125
[244]

b. And how about mushroom growing? Do you think mushroom growing yields very good money, good money, or little money?
   5. Very good money 68
   6. Good money 160
   7. Little money 49
   8. Unascertainable 56

[228]

c. And what about Tilapia. Do you think tilapia raising pays very good money, or good money, or little money?
   9. Very good money 15
   X. Good money 73
   Y. Little money 175
   O. Unascertainable 70

[787]

39. Do you believe in medium strongly, somewhat, or not at all?
   1. Strongly 12
   2. Somewhat 192
   3. Not at all 105
   4. Unascertainable 24

[166]

40.a. Suppose you could do the same work in another rural place and earn ½ more than here. For example, it would be a place 100 kilometers from here. Would you be willing to leave for that place or not?
   5. Yes 118
   6. No 203
   7. Unascertainable 12

.b. IF NO: For what various reasons would you not be willing to go?
(See code at end)

41.a. If you had no land to work in EC-KY would you move to another place or not?
   X. Yes 166
   Y. No 112
   O. Unascertainable 20
   — No Answer 35

b. IF NO: For what various reasons?
(See code at end)

[369]
[829]

42.a. Some people say that, generally speaking people who live in Bangkok have more genuine and lasting happiness than people here in EC-KY. Do you agree or disagree?
   1. Agree 136
   2. Disagree 134
   3. Unascertainable 63

b. IF AGREE: For what various reasons do you agree?

If Agreement (See code at end)

	Qu 11	Qu 13	Qu 15A	
1. Positive, no evidence: very good, good, nice	103	114	77	125 241
2. Positive, with evidence: good results, specific statements	47	120	95	244
3. Neutral or mixed	11	20	6	228
4. Negative, no evidence: no good, bad, of no use	9	5	15	
5. Negative, with evidence: difficult to apply in deep water, must keep using it, too expensive, some results as without fertiliser	33	13	80	
6. Positive, qualified: Fertilizer too expensive	13	—	1	
7. Positive, qualified otherwise: only for high land; very hard to purchase; requires to keep on using it	32	18	18	
8. Respondent states he has no opinion	54	31	86	
X. Negative, qualified: It's not quite good, it depends on the soil	4	4	3	
0. No answer	4	3	1	
9. Respondent's attitude not ascertainable	23	5	11	

Qu 12B		
0. D.A.	85	125 241
1. Too expensive	78	
2. Difficult to purchase	15	
3. Not fit for low land	39	
4. Soil not suitable	3	
5. No ascertainable reason given	28	
6. Too little land	7	
7. Other reasons	56	
8. Have never used it before. Do not now either	12	
X. N.A.	105	
9.	21	

Qu 16B		
X. N.A. Unascertainable	60	125 243 435 458
0. D.A.	151	
1. Nothing, cannot do anything	70	
2. Grow mushrooms	12	
3. Raise poultry	15	
4. Raise fish (including Tilapia	7	
5. Use fertiliser	—	
6. Find job as laborers	6	
7. Other: try to find new seed, sell vegetables, borrow money from neighbors, keep rice until price goes up, economise, send sons to work	86	